



Issue 16, January 28, 1999

Feature Story

Each month we'll provide a feature article on key industry trends and developments. Authored by a member of Intel's Executive Staff, it offers insightful and useful information for product development, planning and execution.

Top News Stories

Delivering an in-depth report on key platforms, products and technologies, our Top Stories provide a monthly source of information on the issues affecting hardware developers. Be sure to check in every month for the latest stories that are driving the evolution of the industry.

Platform News and Information

Every month we cover the latest developments in platform initiatives and technologies. Our "Platforms" pages provide news on the latest trends and initiatives for the business, home, mobile, server and workstation platforms. Our "Industry Events" page keeps you up to date on upcoming industry gatherings targeted at the platform and peripheral developer, including the Intel Developer Forum.

Technology News

Our "Technologies" pages give you quick and detailed information on the industry status of specific platform technologies, from the emergence of the Accelerated Graphics Port (AGP) to the latest advances in Intel® microprocessors, memory, Audio, 1394, DVD, Power Management, and PC 99. This department is your source for the hottest technology and product announcements, white papers, design guides, specifications, tools and developer events available to the industry.

Reader Services

If you are new to *Platform Solutions* and would like to receive this companion newsletter to the on-line version, please visit *Platform Solutions* on-line and go the "Subscribe Now" section to register and sign up for delivery. The on-line version provides lots of direct links for quick access to the developer information and news reported in each issue, whether it's on Intel's Web site or industry Web sites. Please visit the following URL: <http://developer.intel.com/solutions/>

We want you to consider *Platform Solutions* as your personal information resource for the Intel® Architecture platform. If you can help us make it better, or if you have a comment, question or a specific topic you would like to see covered, we want to hear from you. Please take the opportunity to send us an e-mail with your specific feedback or request to: platform.solutions@intel.com

If you do not want to receive this mailing in the future, please send an email to: platform.solutions@intel.com with "unsubscribe" in the body of the message.

On behalf of all of us at Platform Solutions, welcome to the future of the PC platform!

DISCLAIMER: THE MATERIALS ARE PROVIDED "AS IS" WITHOUT ANY EXPRESS OR IMPLIED WARRANTY OF ANY KIND INCLUDING WARRANTIES OF MERCHANTABILITY, NONINFRINGEMENT OF INTELLECTUAL PROPERTY, OR FITNESS FOR ANY PARTICULAR PURPOSE. IN NO EVENT SHALL INTEL OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION, LOSS OF INFORMATION) ARISING OUT OF THE USE OF OR INABILITY TO USE THE MATERIALS, EVEN IF INTEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME JURISDICTIONS PROHIBIT THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATION MAY NOT APPLY TO YOU. INTEL FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS, LINKS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. INTEL MAY MAKE CHANGES TO THESE MATERIALS, OR TO THE PRODUCTS DESCRIBED THEREIN, AT ANY TIME WITHOUT NOTICE. INTEL MAKES NO COMMITMENT TO UPDATE THE MATERIALS.

Table of Contents

[\(Click on descriptions to jump to articles\)](#)

FEATURE	3
CONNECTING "BEYOND THE SPEC"—A REPORT ON THE INTEL DEVELOPER FORUM	3
INSIDE LOOKING IN	5
111 USB DEVICES ON 1 PC? PASS THE PEANUTS!	5
PENTIUM® III PROCESSOR PLATFORM SERIES	9
DIRECT RDRAM ON ITS WAY	9
AGP 4X UPDATE	11
TOP STORIES	13
GET CONNECTED WITH PHONELINE HOME NETWORKING	13
DVD AND DIRECTSHOW* DEVELOPER DAYS CONFERENCE SPONSORED BY INTEL AND MICROSOFT	15
PROBLEM RESOLUTION SOFTWARE: SEAMLESS HELP DESK SUPPORT FOR WfM-ENABLED PLATFORMS	17
DESIGN FOR COMPLIANCE: ACPI TEST METRICS FOR PC 99	19
TECHNOLOGY NEWS	21
PROCESSORS	21
<i>New Pentium® III Processor Developer Web Site</i>	<i>21</i>
<i>Pentium® II Xeon™ Processor with 1MB and 2MB L2 Cache Introduced</i>	<i>21</i>
<i>New Mobile Pentium® II Processors and Celeron™ Processors</i>	
<i>for Performance and Low-Cost Mobile PCs</i>	<i>21</i>
MEMORY	21
<i>Direct RDRAM RIMM Module Reference Designs Available</i>	<i>21</i>
PC EASE OF USE	21
<i>New Industry Roundtable White Paper Coming Soon</i>	<i>21</i>
INSTANTLY AVAILABLE PC	22
<i>Updated Specifications Now Available</i>	<i>22</i>
DVD	22
<i>Moving Forward: DVD and IDF</i>	<i>22</i>
WIRED FOR MANAGEMENT	22
<i>Strong Support for PRS Results in its Addition to WfM Baseline Specification 2.0</i>	<i>22</i>
SYSTEM DESIGN	22
<i>Additions to Low Profile Fan Duct System Specifications</i>	<i>22</i>
<i>White Paper Provides Critical PCB Testing Resource</i>	<i>22</i>
INTEL ARCHITECTURE LABS	23
<i>MetaFlash* Technology Enables Scalable, Photo-Realistic 3D Images</i>	<i>23</i>
<i>HomeRF* Working Group Ratifies SWAP Specification</i>	<i>23</i>
INDUSTRY EVENTS	24

Feature

Connecting “Beyond the Spec”—a Report on the Intel Developer Forum

By Pat Gelsinger
Vice President and General Manager
Desktop Products Group
Intel Corporation

Intel's Vice President of Desktop Products provides a snapshot of how quickly IDF has evolved into a must-attend industry event and a glimpse of what you can expect at the upcoming Spring IDF.

At this time of year, it's customary to issue some kind of grand report. You couple a look at the past year with a look to what's coming, portray your plans as the extension of your previous successes, rally support, and head on your glorious way.

Here at Intel, we've celebrated each New Year by simply driving hard into the next one. We view our relationship with the industry and its developer community in much the same way we view the progression of time—as a process, not an event. We work hard at innovation, we share our discoveries and findings with one another, we learn, we grow. Then we go off and do it some more.

As part of our commitment to that pattern of growth, we host an industry gathering called the Intel Developer Forum, IDF for short. Every spring and fall since September 1997, we've convened an IDF to present and discuss topics that will affect the design of the next generation of platforms, technologies, and products.

What we've heard—and loudly, since last fall's IDF—is that our process has given rise to an event, one of industry magnitude. That said, we want to give you a report on what IDF has become. . .and what we've learned from the developer community.

Going “Beyond the Spec”

It was only a year and a half ago that we announced our very first IDF. We promoted the conference as taking designers “beyond the spec,” providing information that would fill the gaps between the traditional specifications and the point where a product gains user acceptance. We offered to share the experience we'd gained during the development of our own products. Our objective was to work together to minimize the time to market for the new platform technologies, thereby increasing the value provided to our customers.

At a three-day event in San Francisco, some 500 developers showed up for 10 technology tracks with 64 presentations, all by Intel technologists. Most attendees were local to the West Coast; nearly all were from the U.S. The keynotes, also presented by Intel technologists, were opened by our Chairman Emeritus and co-founder Gordon Moore speaking on his now-legendary Moore's Law.

The relatively modest event lived up to its promise. We heard supportive comments like “It helped us develop a technology vision for the next year and a half and saved us a lot of technical and marketing research.” And “IDF was great for my engineers. I'm looking forward to bringing back more of my engineers next year.”

To make IDF worth the trip, we developed it. We used our regular processes to act on other comments—comments about making sure “we're all collaborating effectively” and more broadly involving “others in the industry.”

Designing to be Connected

One short year later, at last September's event, IDF had gone beyond its own original specs. More than 1,500 members of the development community came from around the globe to our gathering in Palm Springs. About a fourth of the 90 presentations came from technical experts from other companies.

This time, industry pundits were on hand to comment on IDF. Some 120 articles appeared in the media, with Microdesign Resources' Microprocessor Report concluding that IDF has become "the leading source of guidance for hardware designers. As Intel engineers assume more responsibility for the future of the PC platform, we expect IDF to become even more important to the PC industry."

We tried for growth. We aimed to help the industry. But we never thought IDF would come so far so fast. Because so much of IDF's value comes from the industry itself, we're pleased to share the responsibility for its success with all of you.

Building great computing products is an industry-wide effort that begins and ends with people. Aside from IDF's formal presentations—in fact, around, during, and between the presentations—the real work of our business takes place person-to-person. We network with one another. We hash out issues. We argue, debate, recommend. Ultimately, like the products we build, we connect.

On behalf of my colleagues here at Intel, I encourage you to join us for next month's IDF. The agenda is filled with topics like these:

- The first public disclosure of performance and timing details for Streaming SIMD Extensions of the Pentium® III Microprocessor.
- The next phase of the IA-64 architecture disclosure, with code examples demonstrating breakthrough performance.
- Details on how to design the next generation of high-speed I/O systems.

Share what you know; share in what we know. IDF is an event that helps propel the development process. It can take us and the work we do farther—faster—when we participate together.

About the Author:

Mr. Gelsinger, who joined Intel in 1979, has over 19 years of experience in general management and product development positions. He holds six patents and more than a dozen applications in the area of VLSI design, computer architecture and communications. He has more than 20 publications in this field including "Programming the 80386," published in 1987 by Sybex, Inc. His promotion to Group Vice President at age 32 made him the youngest vice president in the history of the company.

For More Information:

Please see the [Intel Developer Forum](#) Web site.

Inside Looking In

111 USB Devices on 1 PC? Pass the peanuts!

By Tim Mostad
Senior Technical Marketing Manager
Intel Corporation

This new column, with an insider's perspective, takes a closer look at Intel's recent record-breaking demonstration at Fall Comdex.

A man walks into a bar. There's an engineer and a marketing guy sitting in the bar, having beer. The man says, "I heard you can hang 111 USB devices off a single PC. Is that true?" The marketing guy goes for his newspaper, and the engineer reaches for a book of world records.

And it's no joke. In fact, what happened with USB at last year's Comdex was a technical feat wrapped inside a major industry event, widely reported and designed to get you where you live.

Who thinks of these things, anyway? And where do *they* live?

Technical Marketing Engineers inhabit the netherworlds between the stereotypical engineer with a pocket protector and the exaggerated product marketer (the folks Dilbert and company like to hang out of the window by their feet). TME's have the discipline and expertise necessary to concoct complicated technology demonstrations, but have the job of using whatever means necessary to get it noticed.

It is a combination that keeps them stuck in limbo. To some engineers they are marketing "jerks," and to some marketers, they are engineering "geeks." Oddly enough, this contradiction seems to spawn a kind of creativity that would not be possible otherwise.

Intro/background of the Record Setting Event

In case you didn't see the November 17, 1998 *USA TODAY* article, or other worldwide press coverage, we—the USB Implementers' Forum—connected 111 peripherals to one PC at Fall COMDEX 98 and broke a world record. All the devices worked. Witnesses Martin Reynolds and Nathan Brookwood played with them to verify that. These witnesses were not "ringers" either, but real-live industry analysts. And even though they are both proponents of USB, they were seriously trying to break the setup, if it could be done. Nathan had already spent over two hours on a previous occasion randomizing a carefully laid out setup, looking for the dreaded "blue screen."

On this fateful day both Martin and Nathan spent nearly an hour poking, plugging, unplugging and generally playing "end user" with our USB-equipped PC and a big stack of peripherals. An audience of USB IF members and the press got to watch as Bill Nye, "The Science Guy," plugged in the 111th peripheral to set a world record, one that has been submitted to the Guinness people. No one got to see a "blue screen," and it is still up to Guinness to decide whether this eventually gets listed as a record.

How it Was Done

It may sound simple, but much like any public product demo, this day had its share of challenges. The technical teams started at 8 a.m. to setup the tables full of peripherals and check out the PC. The system had three USB host controllers, two OHCI and one UHCI, but otherwise was a normal 333-MHz Pentium® II processor-based PC.

There are USB topology issues that matter when you try to put this many peripherals on one PC. Maybe one day the OS will make those issues simple enough for even an end user to throw tons of peripherals onto a PC, but for us it took a little work. The main reason we employed technical talent to pre-stage the event was to make sure that a sufficient number of open sockets existed to plug peripherals into, basically creating a solid backbone of hubs.

If only the technical team had heard of Benjamin Franklin and his famous episode with the kite and the key. Static electricity is a very exciting extra ingredient for computer demos. Yes, with all of those bright engineers in one room we still forgot to provide static protection—in Las Vegas, of all places. There was a rumor that the organizers overlooked it intentionally because otherwise there would be no challenge (just a rumor).

Descendent of a Compliance Workshop Experiment

At every USB-IF Compliance Workshop, members participate in a mass peripheral installation experiment much like this one. The workshops are designed to provide valuable feedback to our members about how their products perform with other devices. One of the procedures is called a “Grand Melee,” a term borrowed from the Renaissance Fairs. Melees are much more experimental, with prototype products, as well as some production models of product, but they still follow the same idea: one PC with as many peripherals plugged in as possible.

Besides the obvious value of trying unimagined combinations of peripherals in unplanned topologies for the sake of science, the Melee’s are fun. Many useful associations have occurred as the participants of a Melee network over a beer and pretzels while laughing at the strange results from crossing untested boundaries with prototype USB peripherals.

The Reason for a Public Melee

So really, this event was just an extension of doing Melees at Compliance Workshops, but you might ask “Why do a Melee in public?” This is a very good question, given the extra care needed to make sure that things go smoothly for an audience.

There are a number of answers. Certainly it is an attention-getting event for the USB technology. In addition, seeing a large number of USB peripherals working on one system helps to convey the robustness of the technology. It also gives the world a glimpse of what the Compliance Workshops are like (but without the beer and pretzels).

Perhaps the most important reason for our organization to do this is to highlight the variety of USB peripherals currently available. OK, so we provided a lot of material for hundreds of jokes about “how many mice does it take to run Windows* 98?” But seriously, with one or two exceptions, all of the products on the table were currently shipping. And although there was a large percentage of normal mice, joysticks, keyboards, and hubs, there were still 37 unique product types from different manufacturers in the total mix.

Cool Stuff

Here is a list of some of the unique devices used at this event:

- **Wireless Keyboards and Mice**—Wireless is nice, but what does that have to do with USB, you ask? Simple, USB provides a way to connect the computer side of wireless communications to the devices. There is not sufficient standardization of RF or IR technology to build a cost-effective solution into a PC today.
- **Serial and Parallel Port Adapters**—Many people want a second parallel or third serial port. You can have as many as you want with these, even an added port for a mini laptop that no longer has any built in.
- **Force Feedback Joysticks**—Games are cooler when you can feel the kick from your double-barreled shotgun. Way cooler.

- **Motion-Sensitive Gamepads**—Games are also a lot cooler when you can steer by leaning. There are gamepads that will control the application based on their attitude in space. If you have ever watched a teenager play video games, you can see that there are human genes built just for this technology.
- **Scanners**—An easier connection for scanners is certainly welcome. These are simple because they do not require opening the computer, finding a SCSI address, or even an external power supply.
- **Modems**—Nice fast external modems that just plug-in and don't need a power cube are great. There are also varieties that use the CPU power to do most of the work and therefore make the modem itself simpler, i.e., cheaper.
- **Network Adapters**—Network Interface Cards require opening the computer, and no one likes that. These can be as simple to plug-in as the cool modem with no external power supply.
- **Computer-to-Computer Links**—Laplink* made a business out of a single cable to hook two computers together. That business lives on with the speed improvement and simplicity of USB.
- **ISDN Adapters**—My Internet connection is so fast I don't really care to speed it up, but some people do not feel that way. Most of those same people still hate add-in cards that require opening the computer for installation.
- **Floppy Disk Drives**—Laptops often have a special connector dedicated to supporting the external floppy drive. For as infrequently as that old slug-like medium is used, getting rid of the special connector and using the USB connector that does so many other things seems like a no-brainer.
- **Removable Mass Storage Drives**—Removable Mass Storage comes in a new flavor every week, wouldn't it be great if they could all just plug into a fast port that was already on the PC?
- **Digital Speakers**—They sound so great you can't believe it. Now if we can just get the CD drives to stop shutting down the bus every time they need a little bandwidth they will sound great all the time.
- **Video and Digital Still Cameras**—Video into a PC with no add-in card is the only way to go. High-speed still image downloads are just plain convenient.
- **Printers**—Seems like no printer does everything, so everybody needs three or four of them. It is much easier to find three or four USB sockets than three or four parallel ports. Besides, the bandwidth is higher.
- **Fingerprint Recognition Scanners**—This is not CIA stuff, but these devices make logging into a computer quite simple, while still retaining a good level of security. Personally, I can't handle more than one password, so my entire world is locked with the same ten-digit magic number. I hate it when one of my services "helps me" by making me change it.
- **Shaft Encoders**—This one is really... well... unique. It has no purpose to the average PC user, but if you want to build an instrument to measure the RPMs of the PTO on your tractor, this unit and a laptop is just for you.

And the Answer Is. . .

The record-setting effort was cool, fun, and impressive. Through this whole process, we discovered that even some of the most straight-laced engineers enjoy a good beer with their marketing brothers now and then. We also found out that the typical marketer's hype persists well into beer time. Who knows when someday an argument about USB may break out and an authoritative answer may be needed?

The only question might be will we be listed in a book next to the world record for swallowing goldfish?

About the Author:

Tim Mostad is responsible for demos, white papers, plugfests, technical training—and occasionally beer and pretzels—to support the adoption of new desktop technologies.

For More Information:

Attend the [Intel Developer Forum](#)

Pentium® III Processor Platform Series

This new column provides the latest information on platform technologies arriving with the Intel® Pentium® III processor.

Direct RDRAM on its Way

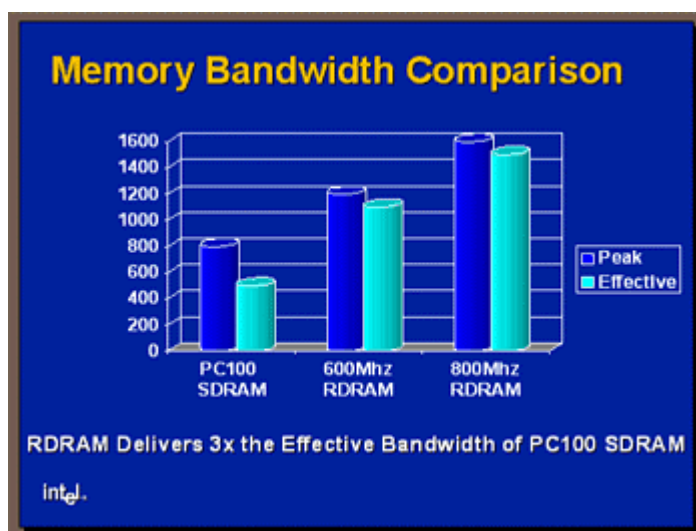
By Jan Camps
PCD Marketing Manager
Intel Corporation

Intel has been working with the industry to enable this new memory technology that will bring at least 2X the bandwidth of current PC100 SDRAM-based systems. All the pieces are coming together for a mid-1999 production ramp.

Beginning mid 1999 mainstream desktop performance PCs will have a decided advantage: Direct RDRAM main memory technology—thanks to a successful industry effort spearheaded by Intel and Rambus Inc.

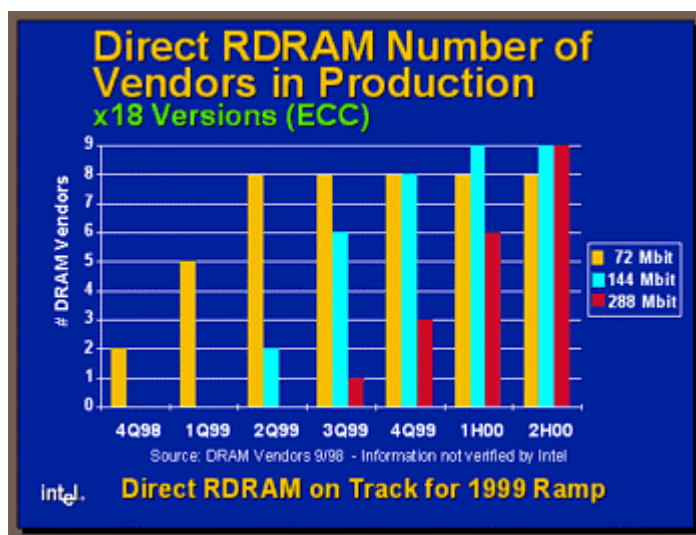
In December 1996 Intel and Rambus Inc., began working together on a new memory technology for 1999 PC platforms. Recently Intel demonstrated this new Direct RDRAM memory technology at work in a PC platform—revealing that all of the pieces are coming together for the production ramp later this year. By successfully demonstrating the inter-operation of Direct RDRAM technology ingredients including Direct RDRAMs, RIMM modules, RIMM connectors, clock chips, and motherboard design and layout, Intel confirmed the reality of the 1999 advent of Direct RDRAM-based systems.

The Direct RDRAM program has hit all the major milestones and is on track for the 1999 product ramp. Later this year Intel will formally announce chipsets and PC platforms that will bring Direct RDRAM to the desktop, workstation, and server market segments. These chipsets will enable the processor, graphics, and I/O to take full advantage of the higher Direct RDRAM performance. In fact, Direct RDRAM-based PCs will have two- to three-times as much memory bandwidth as the PC100 SDRAM-based systems on the market today. Direct RDRAM provides the bandwidth to allow applications to scale in performance with faster processors, graphics, and I/O for years to come. With such compelling reasons to design with Direct RDRAM, expect platforms and memory to ramp at an accelerated pace.



Industry Support

Many [DRAM vendors and memory module suppliers](#) have announced the availability of Direct DRAM silicon and modules for system testing, and more are expected to make announcements in the future. Intel anticipates upwards of seven DRAM makers to have the 800-MHz and 600-MHz Direct RDRAM chips in volume production in the first half of this year, with numerous RIMM module vendors lending their support. The ever-increasing numbers of major DRAM vendors committed to this interface will allow customers to benefit from a number of supply sources.



To further facilitate the development of RIMM modules, Intel and Rambus will provide additional technical design seminars in the Asia-Pacific region at the end of January. Design packages for RIMM modules will be available from the [Intel](#) and Rambus Web sites at that time. Intel will demo the Direct RDRAM-based system at the upcoming [Intel Developer Forum](#), where developers may also receive additional information and training.

Look for more RDRAM news in upcoming issues of *Platform Solutions*, and get ready for the transition to this high-speed memory interface.

About the Author:

Jan Camps, an Intel Marketing Manager, leads the Direct RDRAM marketing program. As a member of the Platform Components Division, Jan has played a key role in successfully bringing new platform technologies such as PC100 SDRAM, AGP, USB, and PCI to the market.

For More Information:

Please see our Intel® Chipsets [main memory specifications](#) site.

AGP 4X Update

By Bob Crepps
Senior Technical Marketing Engineer
Desktop Platform Group
Intel Corporation

The AGP Implementers' Forum has approved a series of Engineering Change Requests for the AGP Interface Specification 2.0. Here's a look at a few important ECRs, including new design considerations for AGP 4X Mode Transfers.

Since the release of AGP Interface Specification version 2.0 in May of 1998, several important Engineering Change Requests (ECRs) have been approved by the Accelerated Graphics Port Implementers' Forum. Beginning with this article, *Platform Solutions News* will carry regular updates on the latest changes to the AGP Specification.

The AGP Design Guide includes important new design considerations for AGP 4X Mode transfers and fast writes. Achieving the high-performance levels and peak bandwidth of AGP 4X Mode (1,066 MB/s) requires the development of add-in cards that support 1.5 volt signaling. Currently, two kinds of AGP add-in card connections to the motherboard are possible: 3.3 volt only and 1.5 volt only. A third "universal" add-in card that can support both 3.3 and 1.5 volts signaling is proposed.

The universal card is an appealing solution because it allows developers to make a smooth transition from 3.3 only to 1.5 volt implementations for graphics and ASIC designs that have buffers that support both voltages. By providing one product that works reliably in all AGP implementations, the universal add-in card would address the widest possible market, while making things easier for end users.

Universal Add-in Card Proposal

The AGP Interface Specification does not define a connection for a universal add-in card. This article touches some of the most important design considerations that designers should be aware of in order to meet the requirements of the specification.

- **Total available power**—Four amps of available power were specified in the original AGP specification. Six 3.3 Vcc pins each can supply one amp, for a total of 6 amps. The universal add-in card requires keys in the edge connector for both 3.3 volt and 1.5 volt connectors. Supporting each key removes a total of two important power pins.
- **Support for 3.3 Vaux**—An add-in card must support 3.3 Vaux in order to provide standby power needed to maintain the register states for PME# wake-up events under the Advanced Configuration and Power Interface (ACPI). The keys required for the universal add-in card also remove the 3.3 Vaux pin from the connector. A universal card cannot support wakeup from sleep states (S3 and lower).
- **Mechanical tolerances**—In add-in cards, a key in the connector is used as a reference point, and mechanical tolerances accumulate from the key. In the universal AGP add-in card, the mechanical reference is at one end of the card, which requires the edge connector be laid out very carefully. Designers should refer to the drawing included in the Universal Add-in Card ECR and note the required tolerances.
- **Managing the TYPEDET# pin**—The TYPEDET# pin is used to inform the add-in card which signaling voltage is supported by the motherboard so that the card can drive the pin accordingly. The current specification defines two states for the pin: "open," and "connected to ground." The motherboard expects the card to define that state. The universal add-in card needs a way of determining the signaling voltage. A Universal card should ground the TYPEDET# pin. On power-up, a motherboard that supports both 3.3 and 1.5 volt signaling will set Vddq based on TYPEDET#. Then, the universal card must program its buffers based on Vddq as supplied by the motherboard.

- Power sequencing—There are subtle power sequencing differences between 3.3 volt and 1.5 volt cards. Designers need to comprehend the specifications for both card types to assure that their card functions properly in both modes.

In addition to these design considerations for AGP universal add-in cards, developers should be aware of other recent Engineering Change Requests for AGP.

ECR 48: AGP Card Retention Feature

AGP connectors are shorter than PCI connectors. In addition, the end plate connector is set further from the back panel of the chassis, which can amplify mechanical backout forces on the card and can diminish the effectiveness of the end plate in retaining the card. The AGP specification calls for a maximum backout of .040 inch. If the card backs out more than this distance, the connection can be interrupted, and the card may be damaged. These factors require the design of a secondary retention mechanism for the card.

The Retention Feature ECR describes card features that provide for attachment of a mechanical device to retain the end of the card opposite from the end plate to prevent backout caused by shock and vibration. The ECR modifies the AGP Specification to allow for attachment only. Keepout areas and tolerances are also defined.

In addition, Intel has defined a reference design of a mechanical device to utilize the features defined in the ECR. The reference design is described in a separate document, the "AGP Retention Mechanism Specification."

Other Important Changes

The Accelerated Graphics Port Implementers' Forum considers additional changes and additions to the specification on an ongoing basis. Here are three more changes with which designers should become familiar:

- ECR 47 defines timing margins to support spread spectrum clocking. This technique reduces EMI in the system by modulating the clock timing of the AGP add-in card with a low frequency signal.
- ECR 49 describes a proposed tolerance change for 1.5 volt connectors.
- Another proposed change includes the addition of SMBus pins to the interface for advanced system management.

Stay Up to Speed with AGP Changes

It should be readily apparent from this discussion that the AGP Specification is evolving—and more changes can be expected in 1999. Keeping up with the changes is the only way developers can ensure that their current and future products will realize the full potential of AGP. Developers should visit the AGP Implementers' Forum Web site on a regular basis for the latest information. And be sure to read *Platform Solutions News* for regular updates.

About the Author:

Bob Crepps is a technical marketing engineer in Platform Industry Enabling within the Intel Desktop Platform Group. He provides industry support for new technologies, including AGP and AC'97.

For More Information:

Visit the [Accelerated Graphics Port Implementers' Forum Web site](#) to download the AGP Interface Specification version 2.0 and supporting documents. Links are provided to the latest ECRs.

Top Stories

Get Connected with Phonline Home Networking

By Craig Hurst
Interactive Marketing Manager
Network Communications Group
Intel Corporation

Intel's new 21145 Phonline/Ethernet LAN controller is a single-chip solution that will help hardware and software developers create a new category of home networking products and applications.

Based on 1998 Dataquest research, Intel estimates there are approximately 18 million U.S. homes today with two or more PCs. This number is expected to grow to 28 million by the year 2003.* Forrester Research projects that home networking could become a billion-dollar market segment by 2002.**

The new Intel® 21145 Phonline/Ethernet LAN controller is designed to help PC and peripheral manufacturers connect with this growing sales opportunity. By stimulating development of home phonline networking products, this Ethernet-based single-chip solution will also make it possible for independent software vendors (ISVs) to create a new category of home networking applications. Intel's commitment to home phonline networking was further underscored by the recently announced plan to produce phonline-based branded home networking products.

Improving on "Sneakernet"

In homes with multiple PCs, users tend to rely on running floppy disks between machines to exchange files and share devices such as printers. And in most households, multiple users must wait their turn to access the Internet.

Intel-sponsored research shows that a substantial majority of homeowners in multiple PC households would welcome a simple and cost-effective home networking alternative. Ethernet networking has not been a popular alternative, principally due to the fact that it confronts homeowners with the expense and headache of drilling holes and pulling wire, in addition to being typically above the complexity threshold for most consumers.

No New Wires

The Intel 21145 Phonline/Ethernet LAN controller enables home PC users to connect their PCs using existing phone lines for simultaneous Internet access, printer and file sharing, and multi-player gaming from separate computers. Intel research further confirms that the overwhelming majority of primary and secondary PCs are already located in the same room as a telephone jack, making phonline-based home networking a great choice. Intel has prepared a phonline home networking fact sheet with additional information. The 21145 controller provides developers with the essential building block required for "no new wires" home networking products.

Intel's 21145 Phonline/Ethernet LAN Controller at a Glance

- **Standard Ethernet data frames**—The 21145 Phonline/Ethernet LAN controller utilizes standard IEEE 802.3 (ANSI 802-3) compliant Media Access Control (MAC) and CSMA/CD (Carrier Sense Multiple Access/Collision Detect) to share the baseband signal on the home network bus. The controller combines standard 802.3 Ethernet frames with the HomePNAPHY header designed specifically for 1-Mbps networking over phonline. Ethernet compliance allows ISVs to quickly adapt existing core competencies with Ethernet LAN applications to create a new breed of application software for the burgeoning home networking marketplace.
- **Spectral compatibility**—The controller uses Frequency Division Multiplexing (FDM) to enable simultaneous operation of other communications services over a single pair of wires, including voice and emerging G.Lite data services. The Intel 21145 features an integrated 10-Mbps Ethernet

physical interface to support UADSL devices and cable modems. The controller is capable of auto-sensing whether it is connected to a phoneline-based network or an Ethernet-based network.

- Multi-functionality—A built-in ISA modem interface and dual PCI device functionality enables developers to create products that support simultaneous phoneline networking and dial-up Internet access.

The Intel 21145 supports 5.0V and 3.3V operation and PCI and CardBus interfaces.

HomePNA Specification Compliance

Intel is a founding member of the Home Phoneline Networking Alliance (HomePNA), an association of industry-leading companies working together to ensure the adoption of a single, unified phoneline networking specification. Intel has contributed to this industry effort in order to further the development of a range of interoperable home networking solutions from multiple vendors. The Intel 21145 is compliant with HomePNA specification 1.0.

Get Connected with Phoneline Home Networking

The growing number of multiple PC households creates significant development and marketing opportunities for PC manufacturers and ISVs. With general availability of the 21145 controller in March, Intel is enabling developers to participate in the widespread deployment of easy to use, affordable and fast home networks.

About the Author:

Craig Hurst is Interactive Marketing Manager in Intel's Home Networking Operation. He is responsible for all on-line marketing efforts relating to home networking and contributes to Intel's home network strategic marketing efforts.

For More Information:

- Additional information about the [Home Phoneline Networking Alliance](#) is available online.
- The [Intel® 21145 Product Brief and documentation](#) are available for download from the Intel Web site.
- Information is available on Intel's branded phoneline-based home [networking products](#).
- Intel's [phoneline home networking](#) fact sheet is available online.

* Dataquest and Intel estimates 1/98

** Forrester Research 2/98

DVD and DirectShow* Developer Days Conference Sponsored by Intel and Microsoft

By Bill Pearson
Technical Marketing Engineer
Desktop Products Group
Intel Corporation

This recent conference helped shorten the learning curve and accelerate DVD content development using the DirectShow standard interface.*

DVD is an exciting—and still relatively new—technology that promises to have a dynamic effect on the PC platform over the course of the next few years. That's because DVD's high capacity ultimately translates into capabilities such as more storage, Dolby Digital* audio, high-quality MPEG2 video, the ability to combine PC and movie content, and Internet connectivity (WebDVD), to name just a few examples. A number of DVD titles now on the market—including the movies *Lost in Space* and *Blade*—demonstrate how these capabilities can be leveraged to provide truly interactive experiences on the PC.

But in order for DVD to become a truly standard peripheral in the same way that CD-ROMs and floppy disk drives are standard on many PCs, compatibility is key. The major issue here is compatibility among the titles, the decoding solutions, and the video hardware. And that's where Microsoft's DirectShow* enters the picture.

The Transition is Underway

Until now, most people have been using Microsoft's Media Control Interface* (MCI) for developing DVD titles. But because MCI was designed before DVD was a reality, incompatibility has been a big issue. In addition, MCI has required developers to include drivers for all of the hardware in their application. One of the big advantages of Microsoft's new DirectShow programming environment is that it offers a standard interface for creating DVD titles which is much simpler and easier to use than MCI. And because DirectShow is a standard interface, it also offers compatibility improvements over MCI, particularly for end users.

The transition is already underway to DirectShow—but as always, there's a learning curve attached. To shorten that curve and accelerate DVD content development using DirectShow, on January 11th and 12th Intel and Microsoft co-sponsored the first DVD and DirectShow Developer Days conference, held at the Embassy Suites hotel in Milpitas, California.

DirectShow* Training and Testing

The two-day conference was a rousing success, with more than 90 people in attendance, including game, reference title, and movie DVD content developers, graphics card vendors, system manufacturers, and DVD tool developers. The first day began with six hours of training, with Intel and Microsoft experts providing everything from basic overviews of DVD and DirectShow to advanced techniques such as creating DVD titles and WebDVD.

The balance of the first day and all of the second was devoted to a hands-on DirectShow development lab, where attendees were invited to set up their own development environments and then consult with Intel and Microsoft experts available to help them debug or write code. Testing rounded out the lab work, with Intel engineers using platforms provided by Compaq, CTX, Micron, Acer, Philips, ATI, Rendition, Quadrant, Zoran and Mediamatics. Tests involved MPEG2 playback, with attention paid to level of quality, detection and identification of visual artifacts, audio/video controls, and a series of installation and shutdown tests. And Intel passed along knowledge gained from working with companies across the industry to help develop some three dozen new DVD titles.

WebDVD

The highlight of the first evening was an informal cocktail party, kicked off by a keynote speech from Jim Banister, the president of Warner Online Media. An open microphone at the party was available to encourage discussion among the attendees. This attracted a variety of distinguished speakers, including Rob Duncan from Panasonic, Michael Carrier from NetTV, Brian Johnston from Intel, and Mike Schmit from Zoran. The balance of the evening served as a networking event, facilitated by a themed mingling game from Microsoft that encouraged interaction among attendees.

One of the biggest hits of the event occurred when Microsoft demonstrated WebDVD and passed out a software development kit for this exciting new technology. As a result, the testing and development labs continued on into the night, well past their scheduled conclusions.

Moving Forward: DVD and IDF

The DVD and DirectShow Developer Days conference was just one facet of Intel's ongoing efforts to enable new advances on the personal computer platform. Looking ahead, Intel is planning to feature DVD—which is a big element of Intel's Visual Computing initiative—among the many events planned for next month's Intel Developer Forum (IDF) in Palm Springs, California. Intel Senior Software Engineer Soubhi Abdulkarim, the chief architect of Intel's DVD testing program, is planning to deliver a speech at the Forum on how to test DVD titles more effectively.

Given the success of the first DVD and DirectShow Developer Days conference, Intel is planning to hold similar conferences in the future. Be sure to keep an eye on future issues of *Platform Solutions News* for more information regarding the dates and locations of these events.

About the Author:

Bill Pearson is a technical marketing engineer at Intel, where he is responsible for Intel's DVD technical marketing. He manages Intel's worldwide DVD Plugfests, and is the author of Intel DVD Technology and Consumer Web sites.

For More Information:

For more information on DVD and related activities by Intel and Microsoft, please check out the following Web sites:

- [DVD](#)
- [DirectShow](#)
- [Intel® DVD Developer Site](#)
- [Intel® DVD Consumer Site](#)
- [IDF Plugfest Events](#)

Problem Resolution Software: Seamless Help Desk Support for WfM-Enabled Platforms

By Shelagh Callahan
IAL Software Architect
Intel Architecture Labs
Intel Corporation

By David G. Lawrence
President
Smart Technology Enablers
Intel Corporation

Intel's PRS agent, available today from Smart Technology Enablers, links managed systems into the IT support process through a trouble ticket methodology defined by the SES and SIS standards.

A significant portion of today's total cost of ownership is due to the effort required to support a system after it's acquired. While help desks provide part of the support solution, they're only as successful as the information they receive.

Distribution of solutions is slowed considerably by the need to manually convert knowledge between a wide range of formats. Imagine a standard knowledge format that would enable a knowledge provider (e.g., a hardware or software vendor) to electronically convey solution information to a wide range of support providers. These providers would then be able to quickly incorporate the information into their own problem resolution efforts.

Another part of the problem is that the information a user provides the help desk is often restricted by the user's experience level and communications skills. To compound matters, users may alter critical portions of their systems by continuing to try to fix the problem while waiting for their call to be answered.

Help is On the Way

Clearly, an automated approach to delivering timely and accurate system information directly to the help desk is required. The standardization to deliver on this vision across multiple platforms, help desks, and knowledge providers has been enabled with the release of the Solution Exchange Standard (SES) and the Service Incident Exchange Standard (SIS)—developed under a joint venture between the Desktop Management Task Force (DMTF) and the Customer Support Consortium (CSC).

SES provides the definitions required to share knowledge between knowledge providers and consumers. Solutions are primarily expressed as related sets of problems and resolutions that can be easily accessed and understood by IT staffs. SIS, meanwhile, builds upon SES to create a standardized help desk trouble ticket that can be exchanged between support requesters and support providers.

By defining a standardized trouble ticket, these standards make it much easier to communicate a service request among various technicians. The standardized solution can then be made available for subsequent use and faster resolution of related problems in the future.

Problem Resolution Software (PRS)

As part of the Wired for Management (WfM) initiative and to help drive the adoption of SES and SIS, the Intel Architecture Labs have developed Problem Resolution Software (PRS). PRS implements an agent used by WfM 2.0-enabled systems and management applications to share support knowledge and exchange trouble tickets. In addition, it provides a programmatic interface that eliminates the need to independently develop parsing and object management functions, ensuring compatibility and ease of implementation.

WfM 2.0-enabled systems use PRS to participate in their own support by providing accurate and timely information about problems, and by allowing systems to receive solutions—many of which can be

implemented automatically—from a variety of support providers. The full value of PRS is achieved when all of the support participants—managed systems, management applications and knowledge providers—have implemented the SES/SIS standards.

The PRS agent is currently available from Smart Technology Enablers, Inc., which has licensed the technology from Intel. Smart Technology Enablers also provides a trouble ticket application that resides on WfM-enabled systems and works with any SIS-compatible management application. Industry interest and support for PRS have been strong, as evidenced by its addition to the WfM Baseline specification v2.0.

Differentiated Products

For today's platform developers, the message is clear: it's time to implement PRS solutions on the next generation of managed systems for 1999. Integrating the PRS trouble ticket agent on a platform can really help to differentiate an OEM's product offering in the marketplace. And OEMs and ISVs can reap the benefits of reduced support costs, improved service and increased customer/user satisfaction by implementing PRS within their own support organizations. The SES/SIS standards and PRS implementation are good examples of Intel's ongoing efforts to enhance the manageability of computing systems and to advance the industry's overall platform development efforts. In concert with companies such as Smart Technology Enablers, Intel will continue to provide forward-looking support technologies within the framework of the Wired for Management industry initiative.

About the Authors:

Shelagh Callahan is an Intel Wired for Management software architect who formerly served as chair of the Desktop Management Task Force's Support Working Group. She is one of the primary architects of the SES and SIS standards, as well as of Intel's SES/SIS-compatible Problem Resolution Software.

David G. Lawrence, president of Smart Technology Enablers, is the current chair of the DMTF Support Working Group. He is also the chair of the USB Device Working Group, and has extensive experience with industry standards development, including all WfM technologies.

For More Information:

SIS/SES specifications at www.customersupport.org or www.dmtf.org

OEM implementations through the Intel Design Guide at
<http://intel.com/ial/wfm/wfm20/design/prs/index.htm>

WfM Baseline specification 2.0 and platform requirements at
<http://developer.intel.com/ial/wfm/wfmspecs.htm>

Smart Technology Enablers information at www.enablers.com

Design for Compliance: ACPI Test Metrics for PC 99

By Jeffrey Reinemann
Staff Engineer
Intel Platform Compliance Operation
Intel Corporation

This article highlights a chapter of the PC 99 Hardware Test Specification intended to provide objective test criteria that ease development of ACPI hardware and BIOS compliant products.

In the January *Design for Compliance: New PC 99 Test Metrics* article, we described how Intel Corporation and Microsoft Corporation are extending their PC 99 System Design Guide co-development effort and gathering industry input to create a new set of PC 99 Test Specifications and tests.

The *PC 99 Hardware Test Specification* provides developers a clear set of objective pass/fail compliance metrics for hardware elements of the *PC 99 System Design Guide*.

This article highlights the Advanced Configuration and Power Interface (ACPI) hardware and BIOS chapter of the *PC 99 Hardware Test Specification*.

New ACPI Test Assertions and Tests

Test assertions are declarations of truth statements derived from the guidelines and industry standards and specifications referenced in the *PC 99 System Design Guide*. Test assertions are clearly stated in the *PC 99 Hardware Test Specification*, with reference to the source documents, and mapped directly to the tests. Over 800 assertions are listed in the ACPI test specification, and of those, over 700 can be tested through software. They are organized into twelve hardware and twenty BIOS groupings, each of which is mapped to specific test cases.

The ACPI compliance tests verify the hardware and BIOS assertions defined in the *PC 99 Hardware Test Specification*, not the operating system ACPI features. Therefore, the ACPI tests are independent of specific operating system implementations.

Sample ACPI Test Assertions

The *PC 99 System Design Guide* specifies that systems must implement the ACPI Specification, Revision 1.0 or later. Requirements in the ACPI specification are the source of the ACPI assertions in the *PC 99 Hardware Test Specification*. A sampling of the assertions generated from the requirements include:

- The SCI is disabled in legacy (non-ACPI) mode.
- In ACPI mode, the SCI is sharable, level sensitive, and active low.
- The SCI_EN enable/disable bit controls routing of interrupts between System Management Interrupts (SMIs) and SCIs.
- Systems that support both legacy and ACPI mode must boot to legacy mode.

The following is a portion of the test case algorithm designed to test these assertions:

1. Verify the system booted to legacy mode.
2. Locate ACPI tables in memory, disable all known SCI events, and load SCI handler.
3. Transition to ACPI mode and verify the SCI configuration.
4. Set SCI_EN to disabled and verify that a Power Management Timer (PMT) MSb toggle event does not generate an SCI.
5. Set SCI_EN to enabled and verify that a PMT MSb toggle event generates an SCI.
6. Transition to legacy mode and verify that a PMT MSb toggle event does not generate an SCI.

The test case output log file begins with an initialization section and concludes with a summary. The initialization section identifies the test parameters, test start date and time, and other relevant target platform information. The summary section also identifies test case pass/fail status, with a total count of warnings and failures.

Between the initialization and summary sections, each tested assertion is clearly identified and reported as pass or fail. Failure messages are tagged using a consistent, unique string, allowing developers to rapidly locate the tag when examining the file. For cases where the failure or warning message provides insufficient context, the log file includes an explanation. Developers can directly map failures back to the ACPI specification by referring to the ACPI compliance test specification for each test case.

To support failure analysis and troubleshooting, the tests have a verbose debug output mode. Depending on the debug level specified, the tests generate increasing levels of detail in the test results log files.

You Play a Key Role!

The ACPI test assertions contained in the *PC 99 Hardware Test Specification* are designed to provide objective ACPI test criteria that will make it easier for developers to design ACPI hardware and BIOS compliant products. You now have an opportunity to download the latest test specification draft and provide your review feedback on the ACPI test assertion coverage and test algorithms.

The current *PC 99 Hardware Test Specification* plan targets a release of draft 0.7 in February 1999, with the goal of releasing version 1.0 of the specification and beta compliance tests in March 1999.

Plan to join us in the PC 99 Hardware Compliance Test Lab session at the February Intel Developer Forum (IDF). During the IDF lab session, developers will be able to experience pre-beta compliance tests first-hand for all four of the technical areas contained in the *PC 99 Hardware Test Specification*.

You are an important part of the process. Get involved today!

About the Author:

Jeffrey Reinemann is a staff software engineer in Intel's Platform Compliance Operation, responsible for developing hardware validation tools for auto-configuration, power management, Wired for Manageability, and BIOS elements of the PC xx System Design Guide. He has a M.S. in Computer Sciences from the University of Wisconsin at Madison and has over 10 years of experience at Intel working on operating systems, embedded computing, and BIOS.

For More Information:

Download the draft 0.5 release of the *PC 99 Hardware Test Specification* and learn more about the System Test Implementers' Forum from the [System Test IF Web site](#).

Technology News

Processors

New Pentium® III Processor Developer Web Site

Now that Intel has announced the new Pentium III processor brand, a new web area has been created to bring developers the latest information. Look to this [new Pentium III processor home page](#) on developer.intel.com for the scoop on Intel's most advanced and powerful processor for desktop PCs to be announced later this quarter.

Pentium® II Xeon™ Processor with 1MB and 2MB L2 Cache Introduced

The Pentium® II Xeon™ processor 450MHz is Intel's second processor speed introduced in the latest Intel Inside® microprocessor family designed exclusively for today's powerful servers and workstations. Building on the architecture of the Pentium II processor, the Pentium II Xeon processor adds the superior performance, manageability, and mission-critical reliability Intel®-based servers and workstations demand. Visit the [Pentium II Xeon processor developer home page](#) for all the latest product information.

New Mobile Pentium® II Processors and Celeron™ Processors for Performance and Low-Cost Mobile PCs

Intel has introduced a family of new processors specifically designed for performance and low-cost mobile PCs. The new mobile Pentium® II processors at 333 and 366 MHz are the first Pentium II processors built on a single processor silicon die, providing mobile users with the benefits of higher performance, lower power consumption, and smaller packaging for the thinnest and lightest mobile PCs. The introduction also included the first mobile Intel® Celeron™ processors at 266 and 300 MHz, providing a dramatic performance boost for the new burgeoning category of low-cost mobile PCs. For product information visit the [Mobile Pentium II processor developer page](#), or the [Mobile Celeron processor developer page](#).

Memory

Direct RDRAM RIMM Module Reference Designs Available

The memory bandwidth requirements of the mainstream performance PC will grow beyond the capabilities of a PC100 SDRAM in 1999. Intel has been working with Rambus and the DRAM industry on a faster main memory implementation for 1999 platforms. This new technology, known as Direct RDRAM, will provide peak data transfers rates of 1.6GB/sec. Direct RDRAM components come in uBGA packages and are assembled on RIMM modules. Link to the [new RIMM module reference designs](#) for memory module suppliers.

PC Ease of Use

New Industry Roundtable White Paper Coming Soon

Many people who do not currently own a PC state that one of the main deterrents to buying one is their perception that PCs are too difficult to use. Some of the PC industry's major companies have formed an industry roundtable to achieve consensus on the top issues that the PC industry needs to address. The soon-to-be-released white paper describes the analysis and results of the roundtable's work. Specifically, it points out the gaps between today's PC user experience and the desired experience. An Executive Summary of this White Paper is [currently available for download](#). To learn more about the Ease-of-Use/Quality Roundtable's work and many other aspects of the Ease of Use programs hosted by Intel and other companies, attend the [Intel Developer Forum](#) February 23 – 25 in Palm Springs.

Instantly Available PC

Updated Specifications Now Available

Get the latest update on [the PCI Bus Power Management Interface Specification and 3.3 Vaux ECR](#). Also, see the latest updates to the Instantly Available [PC Power Delivery Requirements and Recommendations revision 1.0](#) (a.k.a. Power Supply '98) and Version 1.1 of the [Instantly Available PC Power Management Design Guide](#). Also, we are pleased to announce the creation of the [Instantly Available PC newsgroup](#). We encourage you to visit the group and submit any questions that you may have regarding Instantly Available PC power management.

DVD

Moving Forward: DVD and IDF

The DVD and DirectShow Developer Days conference was just one facet of Intel's ongoing efforts to enable new advances on the personal computer platform. Looking ahead, Intel is planning to feature DVD—which is a big element of Intel's Visual Computing initiative—among the many events planned for next month's Intel Developer Forum (IDF) in Palm Springs, California. Intel Senior Software Engineer Soubhi Abdulkarim, the chief architect of Intel's DVD testing program, is planning to deliver a speech at the Forum on how to test DVD titles more effectively. For more information, visit the [IDF web site](#).

Wired For Management

Strong Support for PRS Results in its Addition to WfM Baseline Specification 2.0

Download the latest [WfM Baseline specification](#), version 2.0, which includes the new Problem Resolution Software (PRS). As part of the Wired for Management (WfM) initiative and to help drive the adoption of SES and SIS, the Intel Architecture Labs have developed Problem Resolution Software (PRS). PRS implements an agent used by WfM 2.0-enabled systems and management applications to share support knowledge and exchange trouble tickets. In addition, it provides a programmatic interface that eliminates the need to independently develop parsing and object management functions, ensuring compatibility and ease of implementation. The PRS agent is currently available from [Smart Technology Enablers, Inc.](#), which has licensed the technology from Intel.

System Design

Additions to Low Profile Fan Duct System Specifications

In late December, Intel provided updates to [the Low Profile Fan Duct System Board and Chassis Specification](#) and the [Low Profile Fan Duct System Ingredients Specifications](#). Revision 1.0 of the [Low Profile Fan Duct System Design Guidelines](#), released on December 23, 1998, provides new design guidelines intended for system integrators and Fan Duct suppliers.

White Paper Provides Critical PCB Testing Resource

PCB manufacturers and suppliers have a new resource in the "PCB Test Methodology" white paper. Created within the IAL Scalable Platforms Initiative, this document outlines how to complete accurate PCB trace impedance and propagation velocity measurements, which are critical in dealing with PCB parameters that affect bus design. Download [Printed Circuit Board \(PCB\) Test Methodology](#).

Intel Architecture Labs

MetaFlash* Technology Enables Scalable, Photo-Realistic 3D Images

MetaCreations has announced [MetaFlash* technology](#), which enables Web developers to easily and affordably capture scalable, photo-realistic 3D images for interactive use on the Internet. MetaFlash saves output in the [MetaStream* 3D file format](#), an open format developed by engineers in the IAL Internet Media Initiative. One powerful application has the ability to view, manipulate and compare features of products you might buy over the Internet, such as cellular phones, athletic shoes, or toys.

HomeRF* Working Group Ratifies SWAP Specification

With leadership from IAL's Anywhere in the Home Initiative, the [HomeRF* Working Group has ratified the Shared Wireless Access Protocol \(SWAP\) specification 1.0](#). Over 10 companies have committed to build SWAP-based wireless devices, with the first product anticipated for the marketplace by the end of 1999. SWAP technology also complements the Home Phoneline Networking Alliance (HomePNA) technology by extending home networking to mobile devices.

Industry Events

[The System Builder Summit \(SBS\)*](#)

February 1–4, Scottsdale, Arizona

Billed as a unique forum that brings together system builders and technology vendors, the SBS provides an opportunity for participating vendors to present their products and programs to executives representing many of the leading system builders in the nation. These top system builders, invited and hosted by SBS, will meet with participating vendors in intimate roundtable work sessions to learn about products and programs, as well as exchange information and ideas.

[Intel Developer Forum—Spring](#)

February 23–26, Palm Springs, California

Registration is now open for Spring IDF! Intel's next big developer event in the U.S. features in-depth technical presentations and demonstrations by Intel's chief architects on all Intel® Architecture platforms from Business and Consumer Desktop, to Server, Workstation, Mobile, and Embedded. Stay tuned to Platform Solutions and the IDF Web site for event information as it becomes available.

[Game Developers Conference \(GDC\)](#)

March 15–19, San Jose, California

This is the annual industry event for developers who make entertainment software across all computing platforms.

[Intel Networking Events & Training](#)

For Intel's events and training programs on networking products and technologies, please visit the Intel networking events page.

—End of Platform Solutions Issue 16—